MITSUBISHI

# STEREO PREAMPLIFIER

# DA-P30

| ● Instruction Book | ● Bedienungsanleitung | ● Mode d'emploi |
|---|---|---|
| **Congratulations on your choice of the Mitsubishi Stereo Preamplifier Model DA-P30. For best performance results, please read this instruction book carefully before use.** | **Sie haben gut gekauft! Wir wünschen viel Freude an Ihrem DA-P30! Damit Sie alle Möglichkeiten dieses hochwertigen Gerätes voll ausschöpfen können, haben wir eine ausführliche Bedienungsanleitung erstellt. Bitte, lesen Sie diese vor Inbetriebnahme sorgfältig Punkt für Punkt durch.** | **Nous vous félicitons d'avoir porté votre choix sur le préamplificateur stéréo Mitsubishi DA-P30. Avant d'utiliser cet appareil, nous vous recommandons de lire attentivement ce mode d'emploi pour que vous puissiez en tirer ses meilleures performances.** |
| **WARNING – TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.** | **VORSICHT! SETZEN SIE DEN DA-P30 NIEMALS FEUCHTIGKEIT AUS! ANDERENFALLS DROHT GEFAHR DURCH FEUER ODER STROMSCHLAG!** | **ATTENTION: PROTEGEZ CET APPAREIL DE LA PLUIE ET DE L'HUMIDITE SOUS RISQUE D'INCENDIE ET D'ELECTROCUTION.** |
| For future reference a space has been provided below for recording the serial number of your stereo preamplifier. | Tragen Sie in den Kasten die Serien-Nummer Ihres Gerätes ein, damit Sie diese immer leicht zur Hand haben. | Afin de l'avoir toujours à portée de main, veuillez inscrire le numéro de série de votre appareil dans l'espace réservé à cet effet ci-dessous. |
| Serial # | Serien-Nr.: | Numéro de série |

# PRECAUTIONS

ENGLISH

## 1. GENERAL

### BE SURE TO USE THE CORRECT A.C. POWER SOURCE

The A.C. power requirement is marked on the rear panel of this unit. Connection to any other power source may cause damage to this unit and/or severe electrical shock.

### DO NOT PLUG IN OR UNPLUG THE POWER CORD WITH WET HANDS

There is a great danger of severe electrical shock if the power cord is plugged in or unplugged with wet hands. Do not attempt to unplug the cord from an A.C. outlet by pulling the cord. Firmly grasp the plug to remove it from the A.C. outlet.

### DO NOT ALLOW WATER OR ANY FOREIGN MATTER TO GET INSIDE THIS UNIT

Should water or a metallic object accidentally fall into this unit, immediately disconnect the power cord and consult your authorized service dealer.

### HANDLE THE POWER CORD WITH CARE

Do not bend sharply or twist the power cord. If the insulation becomes damaged, the conductor breaks, or poor contacts occur, request service from your authorized service dealer. Continued use under these conditions, may cause fire or electrical shock.

### DO NOT TOUCH THE INSIDE OF THIS UNIT

There are high voltages inside this unit. Never remove the top or bottom cover. All inspections and repair including fuse replacement, should carried out by your authorized service dealer.

### DISCONNECT THE POWER CORD AT THE FIRST SIGN OF TROUBLE

At the first sign of unusual noise, odor, or malfunction, disconnect the power cord and consult your authorized service dealer. Continued use under these conditions, may increase damage or cause additional problems.

### THIS PRODUCT IS DESIGNED AND WARRANTED FOR CONSUMER HI-FI USE ONLY. NOT INTENDED FOR INDUSTRIAL OR PRO-AUDIO APPLICATIONS.

## 2. LOCATION

### BE SURE TO PLACE IT HORIZONTALLY

Care must be taken to avoid inclining or standing this preamplifier upright, since such conditions can result in improper heat dissipation. Do not cover this ventilation holes by placing another unit on top of this preamplifier or otherwise obstruct their operation by improper location or with any other object.

### AVOID PLACEMENT IN DIRECT SUNLIGHT, NEAR AIR CONDITIONER ETC.

This unit can become unstable if operated in extremely high or low temperatures. Place it in a well ventilated area for proper heat dissipation. Avoid placement in direct sunlight, near air conditioners, poorly ventilated areas or in areas of excess humidity or dust. Do not block the ventilation holes.

## 3. CONNECTIONS

### BE SURE TO TURN OFF THE POWER BEFORE MAKING CONNECTIONS

This is to prevent damage to the speakers from the popping noise which occurs when plugging and unplugging cords.

### USE EXTREME CARE IN MAKING THE CORRECT CONNECTIONS

If you reverse the R (right) and L (left) leads, you will reverse the stereo location of R and L channels.

### MAKE CONNECTIONS SECURELY

If any of the plugs should become loose or disconnected, a hum may develop. If this is not corrected, deterioration of sound quality and possible damage to the speakers may result.

### USE ONLY SHIELDED CORD FOR THE LEADS

Use only shielded cords for interconnecting components. Do not use cords longer than 2 m (6'). Excessive lead lengths can deteriorate high frequeney response and are subject to interference that can result in hum or noise.

### WHEN NOT USING THE PHONO INPUTS, KEEP THE SHORTING PLUGS INSERTED IN THE INPUTS

This is to prevent hum and noise and to prevent the popping noise which can occur when switching the program selector switch without a turntable connected.

### WHEN USING THE COMPANION POWER AMPLIFIER (DA-A30) AND SWITCHING TWO PAIRS OF SPEAKERS FROM THIS UNIT, ENSURE THAT THE COMBINED IMPEDANCE (BOTH PAIRS OF SPEAKERS OPERATING) IS 4 OHMS OR ABOVE

If the combined impedance is below 4 ohms, the load impedance detector circuit may operate and mute the power amplifier output.

. . . . . .

The combined impedance is determined with the following formula.

$$\text{COMBINED IMPEDANCE} = \frac{A \times B}{A + B} \text{ (OHMS)}$$

$$\text{eg. } \frac{8 \times 8}{8 + 8} = 4 \text{ (ohms)}$$

A: Nominal impedance of speaker A
B: Nominal impedance of speaker B

Please consult your audio dealer for additional information.

## 4. OPERATIONS

BEFORE PLACING THE POWER SWITCH IN THE ON OR OFF POSITION, OR OPERATING ON OR OFF, ALWAYS TURN THE PREAMPLIFIER'S VOLUME (ATTENUATOR) CONTROL ALL THE WAY DOWN

This is to protect the speakers from the damage that can occur if the volume level is set high and the power is turned on.

THERE WILL BE NO SOUND FOR A FEW SECONDS AFTER YOU TURN ON THE POWER. THIS IS NOT A MALFUNCTION

This unit is equipped with a power supply muting circuit which prevents popping noise when the power switch is turned on or off.

## 5. CARE

Wipe the cabinet with a soft cloth when it becomes dusty. If it should get really dirty, dampen a soft cloth in a weak solution of mild soap and water, wring it out dry and wipe off. When finished, dry completely with a soft dry cloth. Any volatile materials such as alcohol, thinner, benzine, insecticides, etc. may remove the paint or damage the luster and should not be used.

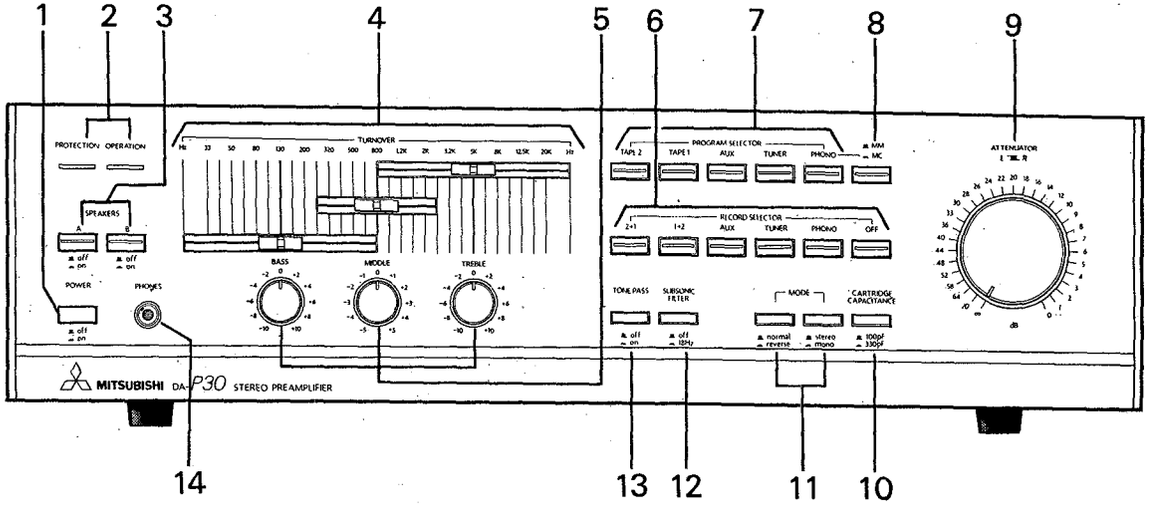
# FRONT PANEL TERMINOLOGY AND FUNCTIONS

**1. POWER (Power Switch)**
This switch is for turning this unit on and off. When in the ON position, the indicators (PROGRAM SELECTOR, RECORD SELECTOR) are illuminated.

**2. PROTECTION, OPERATION (Indicator)**
When connected to the companion power amplifier (DA-A30) with speaker control cables, the PROTECTION indicator (red) will be illuminated for about 3 seconds after the power is switched on, followed by the OPERATION indicator (green) lighting up when the PROTECTION indicator turns off. If, however, abnormal condition arises in the power amplifier, the power amplifier's protection circuit will activate and PROTECTION indicator (red) will be illuminated.

**3. SPEAKERS (Speaker Selection Switches)**
When using the companion power amplifier (DA-A30), the speakers connected to the power amplifier may be controlled with these switches. The "speaker control cable" supplied with the power amplifier must be connected to utilize these switches. Also note that the selection switch's illumination will light up only when the companion power amplifier is connected with the speaker control cable.

| A | B | |
|---|---|---|
| ■ | ■ | For listening with headphones. |
| ▬ | ■ | For listening to the speakers connected to the A terminals on the power amplifier. |
| ■ | ▬ | For listening to the speakers connected to the B terminals on the power amplifier. |
| ▬ | ▬ | For listening to the speakers connected to both A and B terminals on the power amplifier. |



**4 TURNOVER (Turnover Controls)**
The turnover frequency in the treble, middle and bass ranges may be varied continuously. The turnover frequency is increased by moving the lever to the right, and decreased by moving to the left.
For more details, see page 10.

**5 BASS, MIDDLE and TREBLE (Bass, Middle and Treble Level Controls)**
The degree of boosting or attenuation about the turnover frequencies set by the TURNOVER controls can be adjusted.
Select the best positions to suit the characteristics of your speakers and listening room, or personal preference. At the zero position, a flat frequency response is obtained. For more details, see page 10.

**6. RECORD SELECTOR (Program Selection Switches for Recording)**
These switches select which program can be recorded by the tape decks connected to the TAPE 1 and TAPE 2 terminals. It is also used when duplicating from one tape deck to another. Recording and duplicating are performed independently of the program selected for audition by the PROGRAM SELECTOR switches.

| | |
|---|---|
| 1 → 2 (duplicate) | This switch is used to duplicate from the tape deck connected to the PLAY 1 inputs to the tape deck connected to the REC 2 output. |
| 2 → 1 (duplicate) | This switch is used to duplicate from the tape deck connected to the PLAY 2 inputs to the tape deck connected to the REC 1 outputs. |
| AUX | For recording from a second tuner, turntable, with a high output ceramic cartridge, tape deck for playback use, television audio, or any suitable high output sources connected to the AUX inputs. |
| TUNER | For recording programs from the tuner connected to the TUNER inputs. |
| PHONO | This switch is used for recording a disc from the turntable connected to the PHONO inputs. |
| OFF | Always switch to this position when not recording. |

**7. PROGRAM SELECTOR (Program Audition Selection Switches)**
These switches select the desired program source for audition. They operate independently of the source selected for recording, but can be used for monitoring.

| | |
|---|---|
| TAPE 2 | This switch is used to playback or monitor the recording of a tape deck connected to the PLAY 2 inputs. |
| TAPE 1 | This switch is used to playback or monitor the recording of a tape deck connected to the PLAY 1 inputs. |
| AUX | This switch is for listening to a second tuner, a turntable with a high output ceramic cartridge, an 8-track tape cartridge player, television audio, or any suitable high output sources connected to the AUX inputs. |
| TUNER | This switch is for listening to programs from the tuner connected to the TUNER inputs. |
| PHONO | This switch is for listening to a turntable unit connected to the PHONO inputs (MM/MC inputs). |

**8. PHONO MM/MC (Selection Switch for Moving Magnet or Moving Coil Cartridges)**
Select the MM position and connect your turntable to the MM inputs if your turntable unit is fitted with a moving magnet cartridge. Select the MC position and connect your turntable to the MC inputs when using a moving coil cartridge.

**9. ATTENUATOR (Volume Control)**
This control adjusts the sound volume from the speakers and the headphones. The volume is increased by rotating clockwise, and decreased by rotating counterclockwise.

**10. CARTRIDGE CAPACITANCE (Selection Switch for Cartridge Capacitance)**
Suitable matching of the MM cartridge and MM phono input capacitance can be selected with this switch. Improper matching will result in a change of frequency response especially in the high range. Therefore, select either 100pF or 330pF position depending on the cartridge being used. (Refer to the cartridge manufacturer specifications)

| | |
|---|---|
| NOTE: | The capacitance of the turntable output cables must also be included in the calculation of input capacitance for matching. |

**11. MODE (Mode Switches)**
These switches select stereo, monaural or reverse.

| | |
|---|---|
| STEREO | The normal play position. Sounds on the left channel are reproduced through the left speaker, and sounds on the right channel are reproduced on the right speaker. |

# REAR PANEL TERMINOLOGY AND CONNECTIONS

MONO Program material from both right and left channel is combined and reproduced through both speakers.

NORMAL This is the position for normal use with left and right channels reproduced from left and right speakers respectively.

REVERSE In this position, left and right channels are reversed, so the left channel will be reproduced from the right speaker, and the right channel from the left speaker.

**12. SUBSONIC FILTER (Subsonic Filter Switch)**
This filter attenuates the frequencies below 18 Hz on the right and left channels at a 12 dB/oct. rate. The subsonic filter is used to remove unwanted low frequency noise, and to prevent acoustic feedback.

**13. TONE PASS (Tone Control Bypass Switch)**
This switch is used for cancelling the tone control on the right and left channels.

ON In this position, the tone control circuit is removed completely from the signal path and flat response is obtained.

OFF Tone controls can be adjusted. Note that in this position, the TURNOVER controls are illuminated to denote that the tone control circuit are activated.

**14. PHONES (Headphones Output)**
For stereo listening with headphones, plug the headphones into this output. Listening by headphones is possible at all positions of the SPEAKERS switches.

**PHONO MC (Phono Inputs for MC Cartridge)**
The input impedance of phono MC is 10 ohms. The output leads from a turntable equipped with an MC cartridge are connected here.

**PHONO MM (Phono Inputs for MM Cartridge)**
The input impedance of phono MM is 47k ohms. The output leads from a turntable equipped with an MM cartridge are connected here.

**TUNER (Tuner Inputs)**
The output leads from the tuner are connected here.

**AUX (Auxiliary Inputs)**
These inputs may be used for television audio or any suitable high output source.

**PLAY 1, PLAY 2 (Tape Playback Inputs)**
These inputs are for tape playback. Connect the tape deck outputs here.

**REC 1, REC 2 (Recording Tape Outputs)**
These outputs are for use when recording on tape. Connect the tape deck inputs here.

**GND (Ground Terminal)**
Sometimes, hum or other noise may develop when a turntable is connected to this unit. In such a case, connect the ground wire of the turntable to this terminal.

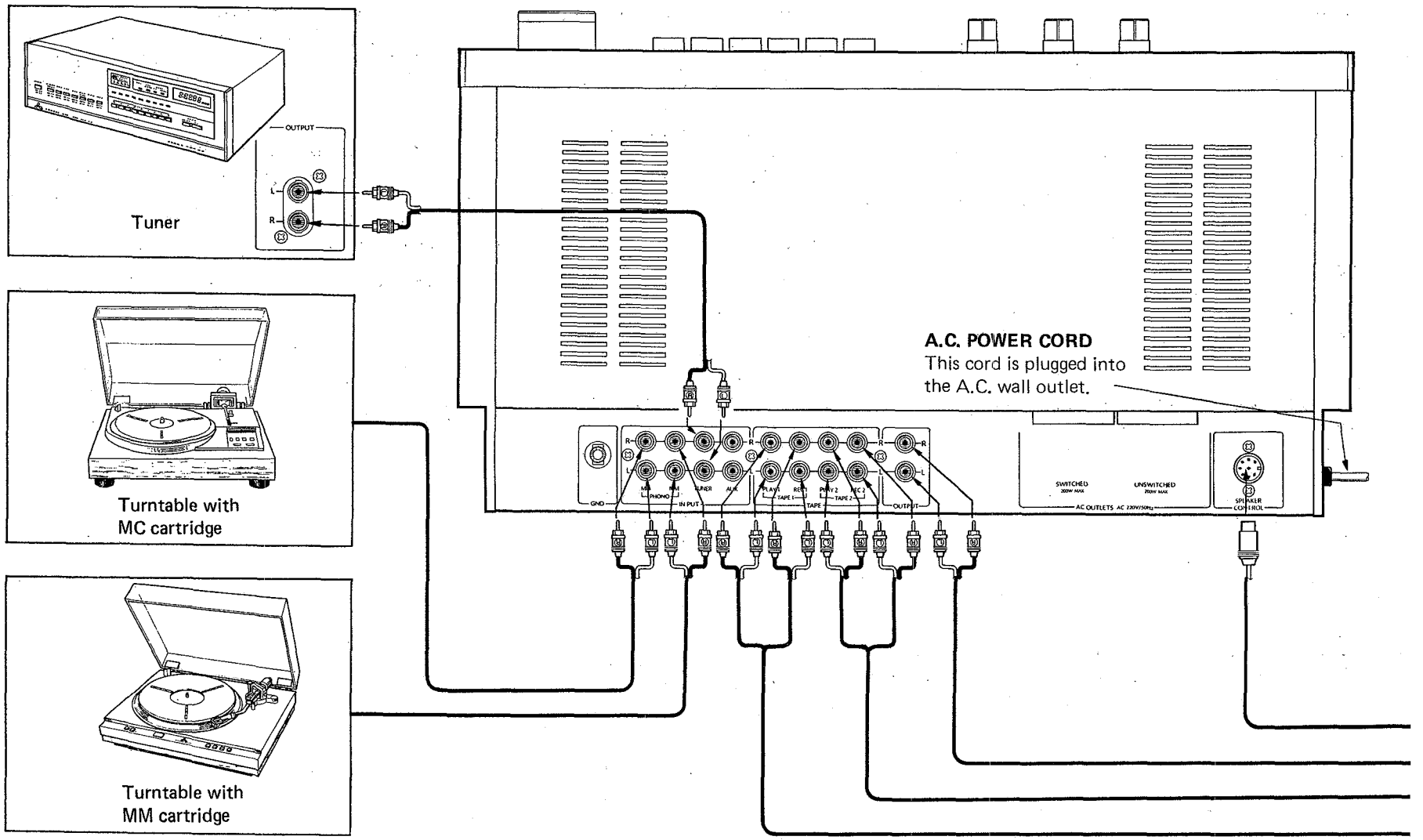
**OUTPUT (Preamplifier Outputs)**
The preamplifier outputs are connected to the inputs of the power amplifier.

**SWITCHED (A.C. Outlets)**
A.C. power is available from these outlets when the POWER switch is on. They may be used for the power amplifier, etc. The total output power must not exceed 500W.

**UNSWITCHED (A.C. Outlet)**
A.C. power is available from this outlet whether the POWER switch is on or off. It may be used for tuner (DA-F30), etc. The output power must not exceed 300W.

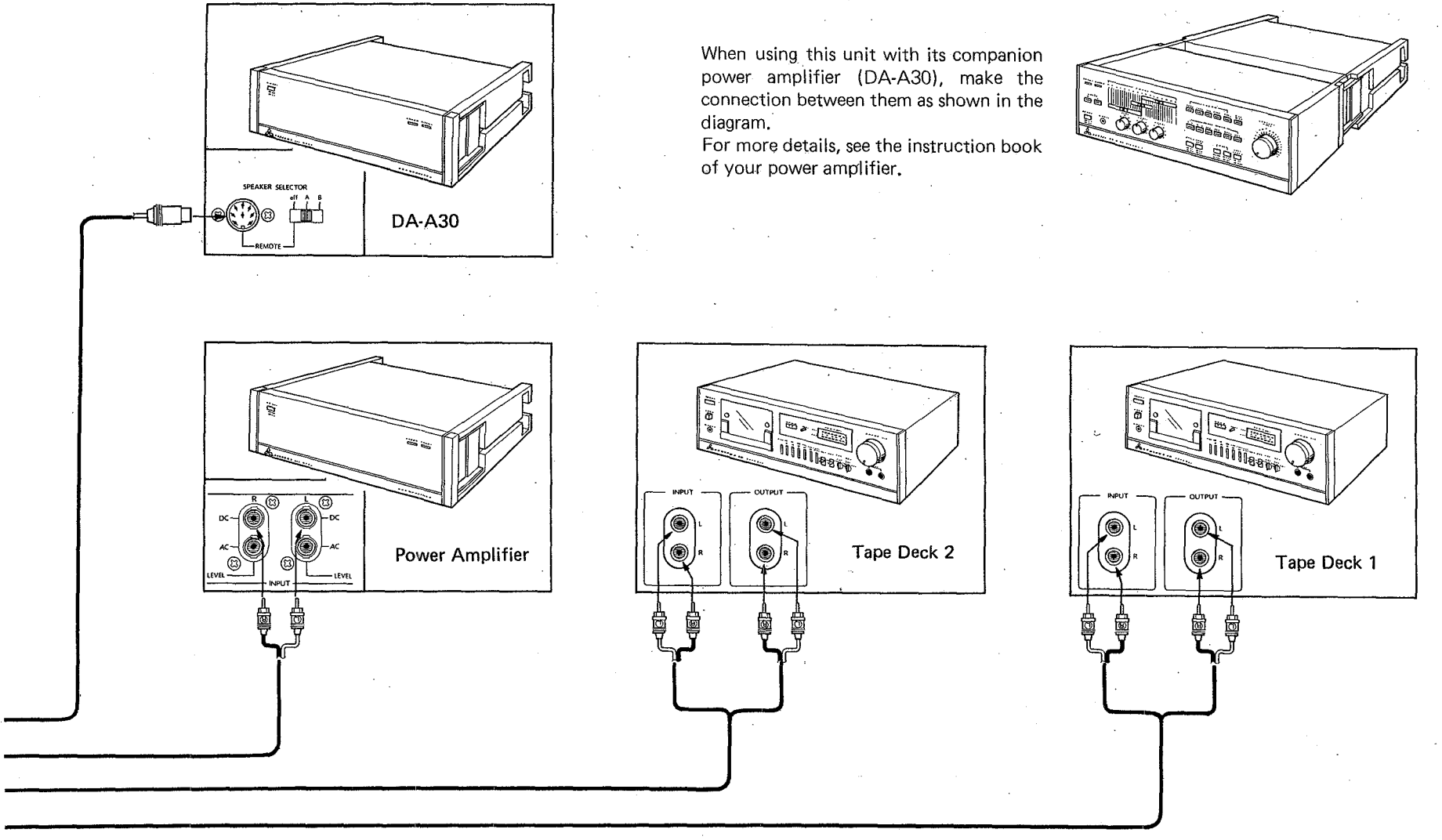
**SPEAKERS CONTROL (Speaker Control Output Terminal)**
When using a companion power amplifier (DA-A30), this terminal is connected to the "REMOTE" terminal on the power amplifier by means of the "speaker control cable" supplied with the power amplifier. This allows control of the speakers from the front panel of this unit.

*


OUTPUT
L
R
Tuner
Turntable with
MC cartridge
Turntable with
MM cartridge
A.C. POWER CORD
This cord is plugged into
the A.C. wall outlet.
GND
PHONO
TUNER
AUX
TAPE 1
TAPE 2
OUTPUT
SWITCHED
UNSWITCHED
AC OUTLETS
SPEAKER
CONTROL

When using this unit with its companion power amplifier (DA-A30), make the connection between them as shown in the diagram.
For more details, see the instruction book of your power amplifier.





# OPERATIONS

## BEFORE SWITCHING ON

Check the following items before pushing the POWER switch to the ON position.

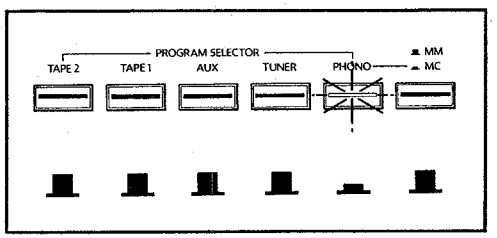
- All components are properly connected.
- The SPEAKERS switches (A, B or A + B) for the speakers you have connected are in the ON position when using this unit with its companion power amplifier (DA-A30).
- The ATTENUATOR control is turned fully counterclockwise (to minimum volume, the ∞ position).
- All other controls are turned to the "center or 12 o'clock" position.

Only now should you depress the POWER switch to the ON position.

NOTE: Failure to turn the ATTENUATOR fully down can severely damage the speakers when the POWER switch is pushed to the ON position.

## 1. PLAYING DISCS

❶ Depress the PROGRAM SELECTOR switch to the PHONO position. If your cartridge is of the moving coil (MC) type, depress the PHONO MM/MC switch to the MC position: with moving magnet cartridge selects the MM position.



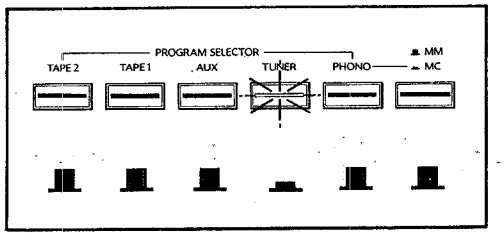

❷ Operate the turntable.

❸ Select the desired volume level with the ATTENUATOR control.

NOTE: When using a high output power amplifier, it is possible to damage the speakers with excessive volume levels. Be extremely carefull not to apply excessive input to the speakers when using speakers with a maximum input rating less than the amplifier's rated power output.

## 2. LISTENING TO BROADCAST

❶ Depress the PROGRAM SELECTOR switch to the TUNER position.




❷ Operate the tuner.

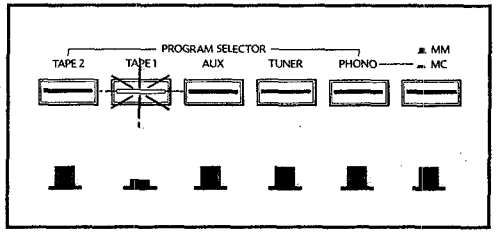
❸ Select the desired volume level with the ATTENUATOR control.

NOTE: If the tuner has "variable" output, it is convenient to set the output level so that the volume is at approximately the same level as the other sources connected to this unit.

## 3. TAPE DECK RECORDING AND PLAYBACK

### • PLAYBACK

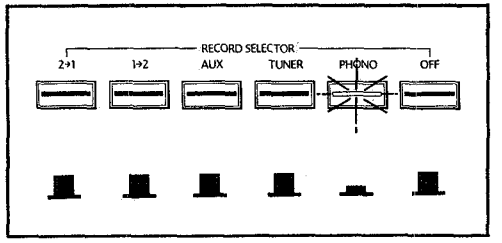
❶ Depress the PROGRAM SELECTOR switch to the TAPE 1 (or TAPE 2) position.




❷ Operate the tape deck in the playback mode.
❸ Now set the desired volume level with the ATTENUATOR contol.
❹ If the tape deck is fitted with an output level control, adjust this so that your ATTENUATOR setting gives you approximately the same volume as it would when listening to the TUNER section.

### • RECORDING

❶ Depress the RECORD SELECTOR switch to the program source you wish to record.



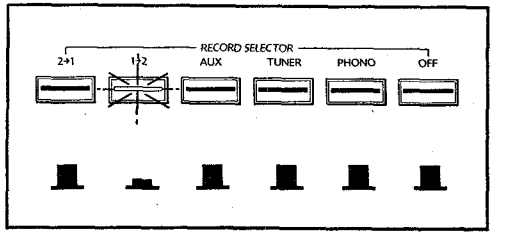

❷ Operate the tape deck in the recording mode.
❸ Play the source to be recorded.
❹ If you depress the PROGRAM SELECTOR switch to the same program source, you will be able to hear the program you are recording. You can, of course, listen to any other program source while the recording is in progress.
❺ If your tape deck is of the three-head kind (with separate record, playback and erase heads), you will be able to monitor the recording while it is being made. Depress the PROGRAM SELECTOR to TAPE 1 (or TAPE 2 — whichever you are using).
❻ Adjust the recording level with the input level controls on the tape deck.

NOTE: The ATTENUATOR, tone controls, filters, etc., have no effect on the recording.

### • DUPLICATING

Duplicating is simply playing back a tape on one tape deck and recording it on another.

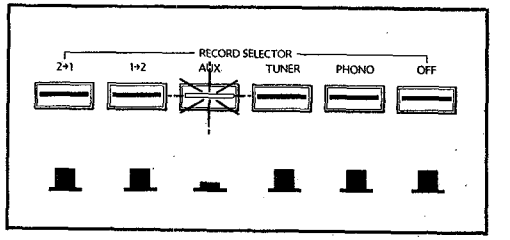
❶ Depress the RECORD SELECTOR switch to the 1 → 2 (or 2 → 1).




❷ Operate one tape deck, connected to the PLAY 1 (or PLAY 2) inputs, in the playback mode, and the other, connected to the REC 2 (or REC 1) outputs, in the recording mode.
❸ Other instructions are exactly the same as for recording and playback (as detailed).

## 4. PLAYING FROM OTHER SOURCES

❶ Depress the PROGRAM SELECTOR switch to the AUX position.




❷ Operate the unit (8-track tape cartridge player, etc.).
❸ Now set the desired volume level with the ATTENUATOR control.

## 5. LISTENING WITH HEADPHONES

❶ Plug the headphones into the PHONES output.
❷ Now set the desired volume level with the ATTENUATOR control.
❸ The speakers will not be automatically muted : if you do not want to use them, switch them off with the SPEAKERS (A, B) switches.
❹ Low impedance (8 ~ 16 ohms) headphones are best. Higher impedance headphones may require rather higher setting of the ATTENUATOR control. Be sure to turn the volume down again before switching back to your speakers.

## 6. LEVEL AND TURNOVER FREQUENCY CONTROLS

One of the major features of the DA-P30 Preamplifier is the separate BASS, MIDDLE and TREBLE tone controls plus independent turnover frequency controls for each of the 3 ranges, thereby enabling tonal nuances of the sound output to be adjusted in an infinite number of combinations. That means you can adjust the tonal levels to exactly the way you want, taking the characteristics of different speaker systems and listening environments into account for ideal listening pleasure.
Adjust the turnover frequencies and the bass, middle and treble levels in the following manner.

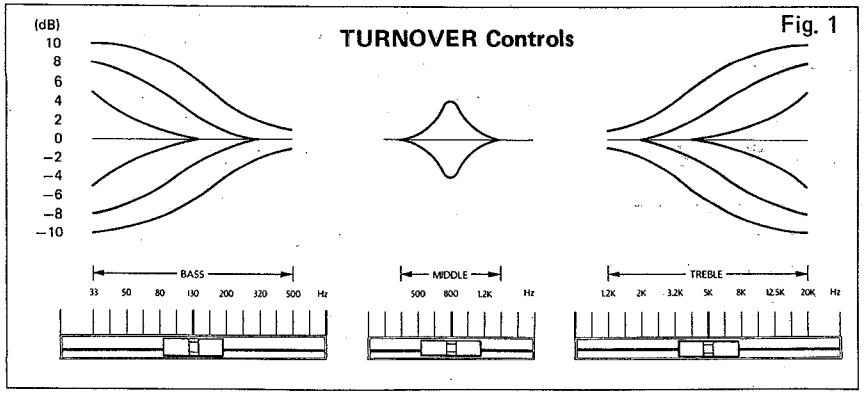
(1) Turnover frequencies may be adjusted to any frequency in the following frequency ranges simply by sliding the corresponding TURNOVER frequency controls to the left and right of the center positions.

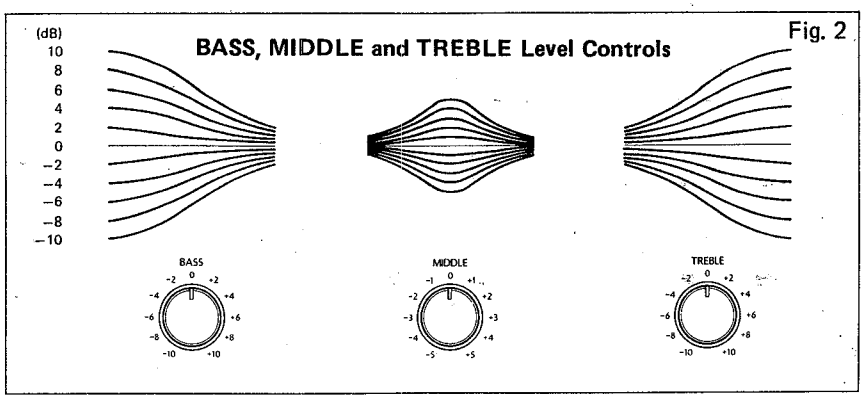
**Bass turnover frequency adjustment range:**
**33Hz to 530Hz.**
**Middle turnover frequency adjustment range:**
**400Hz to 1,600Hz.**
**Treble turnover frequency adjustment range:**
**1.25kHz to 20kHz.**
Turnover frequency is reduced when the control lever is moved to the left, and increased when moved to the right. The changes in turnover frequencies when the control levers are moved left and right are outlined in the following diagrams. (Fig. 1)

(2) The BASS control is for adjusting the tonal level in the low frequency range. When turned clockwise from the center "0" position, the frequencies in this range are boosted in 2dB steps from +2dB to +10dB. And when turned counterclockwise, the frequencies are attenuated in 2dB steps from –2dB to –10dB.

The MIDDLE control is for adjusting the tonal level in the middle frequency range. When turned clockwise from the center "0" position, the mid-range frequencies are boosted in 1dB steps from +1dB to +5dB, while when turned counterclockwise, the frequencies are attenuated in 1dB steps from –1dB to –5dB.
The TREBLE control is for adjusting the tonal level in the high frequency range. When turned clockwise from the center "0" position, the high range frequencies are boosted in 2dB steps from +2dB to +10dB, while when turned counterclockwise, the frequencies are attenuated in 2dB steps from –2dB to –10dB.

Note that the frequency response is completely flat when all tone controls are in the center "0" positions. The relation between the BASS, MIDDLE and TREBLE tone control posotions and the tonal level boost/attenuation is outlined in the following diagrams. (Fig. 2)



# BEFORE TAKING YOUR PREAMPLIFIER IN FOR SERVICING....

First check to ensure that all other components are properly connected to this unit and are operating normally. Then check the following items.

| SYMPTOM | CAUSE | REMEDY |
|---|---|---|
| ◇Power does not come on when the POWER switch is turned on. | ◇Power cord not completely plugged in. | ◇Plug in completely. |
| ◇No sound | ◇PROGRAM SELECTOR,SPEAKERS switches are in the wrong position.<br>◇Nominal speaker impedance is less than 4 ohms and protection circuit on the power amplifier is operating.<br>◇Speaker leads or plug not completely plugged in.<br>◇Speaker (+) and (—) leads are touching. | ◇Place switches in the proper position.<br>◇Use speakers with nominal impedance of 4 ohms or above.<br>◇Plug in completely.<br>◇Separate the leads. |
| ◇Noise | ◇Turntable ground wire not attached.<br>◇Turntable output cord too close to power cord.<br>◇Plugs not completely plugged in. | ◇Connect ground wire to the GND terminal.<br>◇Separate the cords.<br>◇Plug in completely. |
| ◇Howling | ◇Caused by feedback. This occurs because speaker vibrations are being transmitted to the turntable. | ◇Place the speakers and the turntable as far apart as possible. It is also helpful to put an insulator under the turntable. |
| ◇Poor sound quality | ◇Too much power applied to speakers. | ◇Adjust the ATTENUATOR control. |
| ◇No stereo effect and poor bass | ◇Plugs (+) and (—) connections are reversed. | ◇Correct the plugs connections. |
| ◇No sound for 3 — 5 seconds after power is switched on. | ◇Muting circuit is operating to eliminate the popping noise when power is turned on. | ◇This is not a malfunction. |
| ◇Volume level difference between tuner and records. | ◇Receiver signal strength and record level are different. | ◇It is not always possible to remedy this completely. Adjust the tuner output level so that it is the same as the phono volume. |

# SPECIFICATIONS

**Input sensitivity/Impedance**

| | |
|---|---|
| PHONO MC | 0.13mV/10 ohms |
| PHONO MM | 2.8mV/47k ohms/100pF or 330pF |
| TUNER, AUX, PLAY 1, PLAY 2 | 150mV/47k ohms |

**Output level/Impedance**

| | |
|---|---|
| OUTPUT | 1V (rated output)/600 ohms |
| | 19V (maximum output, TONE PASS: ON) |
| REC 1, REC 2 | 150mV/600 ohms |
| PHONES | 920mV (at 8 ohms load)/15 ohms |
| | Headphones impedance: 8 ~ 16 ohms |

**Equivalent input noise level (IHF, A network)**

| | |
|---|---|
| PHONO MC | −157dB (V) (47 ohms terminated) |
| PHONO MM | −136dB (V) (closed circuit) |
| TUNER, AUX, PLAY 1, PLAY 2 | −126dB (V) (closed circuit) |

**Signal to noise ratio (IHF, A network, at rated output)**

| | |
|---|---|
| PHONO MC | 80dB (rated input, 47 ohms terminated) |
| PHONO MM | 85dB (rated input, closed circuit) |
| TUNER, AUX, PLAY 1, PLAY 2 | 110dB (rated input, closed circuit) |

**Signal to noise ratio (DIN)**

| | |
|---|---|
| PHONO MC | 72dB (47 ohms terminated) |
| PHONO MM | 73dB (2.2k ohms terminated) |
| TUNER, AUX, PLAY 1, PLAY 2 | 106dB (closed circuit) |
| | 92dB (47k ohms/250pF terminated) |

**Total harmonic distortion**
**(at rated output attenuator −20dB from 20Hz to 20kHz)**

| | |
|---|---|
| PHONO MC | 0.004% |
| PHONO MM | 0.002% |
| TUNER, AUX, PLAY 1, PLAY 2 | 0.0015% |

**Channel separation**

| | |
|---|---|
| PHONO MC, PHONO MM | Crosstalk is less than noise level at 1kHz<br>75dB at 20kHz |
| TUNER, PLAY 1, PLAY 2 | Crosstalk is less than noise level at 1kHz<br>80dB at 20kHz |

**Frequency response**

| | |
|---|---|
| PHONO MC, PHONO MM | ±0.2dB from 20Hz to 20kHz (RIAA STD) |
| TUNER, PLAY 1, PLAY 2 | $^{+0}_{-0.5}$ dB from 10Hz to 100kHz |

**Slew rate**

| | |
|---|---|
| AUX | 200V/μsec at AUX input |

**Tone control**

| | |
|---|---|
| BASS | ±10dB (Turnover Freq. 33Hz ~ 530Hz) |
| MIDDLE | ±5dB (Turnover Freq. 400Hz ~ 1.5kHz) |
| TREBLE | ±10dB (Turnover Freq. 1.25kHz ~ 20kHz) |

**Subsonic filter** 18Hz (−12dB/oct)

**Phono overload level (at 1kHz with 0.1% THD)**

| | |
|---|---|
| PHONO MC | 16mV |
| PHONO MM | 380mV |

**Power consumption** 33W

**Dimensions**
**(W x H x D)** 470 x 135 x 241mm
(18-1/2 x 5-3/8 x 9-1/2")

**Weight** 7.1kg (15.7 lbs)

**NOTE:** All figures are measured with TONE PASS on unless otherwise stated.

Design and specifications are subject to change without notice for improvement.